CLAIMS

I claim:

1. A process for accomplishing fluid therapy in a living human comprising the step of introducing into the body of such human an aqueous solution containing at least one anion species selected from the group consisting of l-lactate, pyruvate, d-betahydroxybutyrate, acetoacetate, and mixtures thereof, the total concentration of said anions in said solution being in the range from about 0.01 to 1400 millimoles per liter.

2. The process of claim 1 wherein said introducing is accomplished parenterally.

3. The process of claim 1 wherein said total concentration of said anions ranges from about 1 to 1000 millimoles per liter.

4. The process of claim 1 wherein said anions present in said solution comprise l-lactate anions.

5. The process of claim 1 wherein said anions present in solution comprise pyruvate anions.

6. The process of claim 1 wherein said anions present in said solution comprise d-betahydroxybutyrate.

7. The process of claim 1 wherein said anions present in said solution comprise acetoacetate.

8. The process of claim 1 wherein said anions present in said solution comprise a mixture of 1-lactate anions and pyruvate anions.

9. The process of claim 1 wherein said anions present in said solution comprise a mixture of d-betahydroxybutyrate and acetoacetate anions.

10. The process of claim 1 wherein said anions present in said solution comprise a mixture of 1-lactate, pyruvate, d-betahydroxybutyrate and acetoacetate anions.

11. The process of claim 1 wherein said solution contains at least one cation selected from the group consisting of sodium, potassium, calcium, magnesium, ammonium, and mixtures thereof, the total milliequivalent quantity of such cations in said solution being equal to the total milliequivalent quantity said anion(s).

12. The process of claim 1 wherein the cations present in said solution comprise sodium.

13. The process of claim 1 wherein said solution contains at least one of the following mixtures:

(a) 1-lactate anions and pyruvate anions in a milliequivalent ratio of from about 20:1 to 1:1, and

(b) d-betahydroxybutyrate anions and acetoacetate anions in a milliequivalent ratio of from about 6:1 to 0.5:1, and further contains sodium-cations and chloride anions, and the milliequivalent ratio of sodium to chloride in either below 1.24 or above 1.6.

14. The process of claim 1 wherein said introducing is accomplished by irrigation.

15. The process of claim 1 wherein said introducing is accomplished by hemodialysis.

16. The process of claim 1 wherein said introducing is accomplished by peritoneal dialysis.

17. The process of claim 1 wherein said introducing is accomplished by oral ingestion.

18. The process of claim 1 wherein said solution additionally contains bicarbonate anions and the Ph of said solution is adjusted to a desired value in the range from about 6 to 8.4 by the addition of the hydrogen form of at least one acid selected from the group consisting of 1-lactic, d-betahydroxybutyric, acetoacetic, and pyruvic in an amount sufficient to give such desired Ph.

19. In an improved process for accomplishing treatment of metabolic acidosis in a living human, the step of introducing into

said human a solution comprising water having dissolved therein the following components in the respective amounts indicated:

Component	Quantity
Cations	(in mM)
Na^+	0-2400
K^+	0-60
Ca^{2+}	0-4
Mg^{2+}	0-3
Anions	
1-lactate	0-2400
pyruvate	0-2400
d-betahydroxybutyrate	0-2400
acetoacetate	0-2400

provided that the total amount of 1-lactate, pyruvate, d-betahydroxybutyrate and/or acetoacetate anions present in any given solution ranges from about 0.1 to 2400 mM with the total amount of said cations being such as to achieve electrical neutrality in such given solution, and further provided that said solution has a pH ranging from about 5 to 8.2.

20. A fluid composition for treatment of metabolic acidosis in a living human comprising water having dissolved therein the following components in the respective amounts indicated:

Component	Quantity
Cations	(in mM)
Na^+	0-2400
K^+	0-60
Ca^{2+}	0-4
Mg^{2+}	0-3
Anions	
1-lactate$^-$	0-2400
pyruvate	0-2400
d-betahydroxybutyrate	0-2400
acetoacetate	0-2400

provided that the total amount of 1-lactate, pyruvate, d--betahydroxybutyrate and/or acetoacetate anions present in any given solution ranges from about 0.1 to 2400 mM with the total amount of said cations being such as to achieve electrical neutrality in such given solution, and further provided that said solution has a pH ranging from about 5 to 8.2.

21. In an improved process for accomplishing rehydration, electrolyte replacement, and nutrition in a living human suffering prom fluid, electrolyte, and nutritional depletion, the step of introducing into said human a solution comprising water having dissolved therein the following components in the respective quantities indicated:

Component	Quantity
Cations	(in mM)
Na^+	130-160
K^+	2-10
Ca^{2+}	0.5-2.5
Mg^{2+}	0-1.5
Anions	
Cl^-	90-115
l-lactate	0-55
pyruvate	0-55
d-betahydroxybutyrate	0-55
acetoacetate	0-55

provided that in any given said solution, the total amount of 1-lactate, pyruvate, d-betahydroxybutyrate and/or acetoacetate anions present ranges from about 0.1 to 55 mM with the total amount of said cations being such as to achieve electrical neutrality in any given said solution, and further provided that said solution has a pH ranging from about 6.0 to 7.5.

22. A solution for rehydration, electrolyte replacement, and nutrition comprising water having dissolved therein the following components in the respective quantities indicated:

Component	Quantity
Cations	(in mM)
Na^+	130-160
K^+	2-10
Ca^{2+}	0.5-2.5
Mg^{2+}	0-1.5
Anions	
Cl^-	90-115
1-lactate$^-$	0-55
pyruvate	0-55
d-betahydroxybutyrate	0-55

acetoacetate	0-55

provided that in any given said solution, the total amount of l-lactate, pyruvate, d-betahydroxybutyrate and/or acetoacetate anions present ranges from about 0.1 to 55 mM with the total amount of said cations being such as to achieve electrical neutrality in any given said solution, and further provided that said solution has a pH ranging from about 6.0 to 7.5.

23. In an improved process for replacing at least in part the renal function of a living human patient by dialysis by allowing said patient's blood to pass over one face of a semipermeable membrane while a dialysis fluid contacts the opposite face, the improvement which comprises employing as said dialysis fluid an aqueous solution comprising water which has dissolved therein the following components in the respective amounts indicated:

Component	Quantity
Cations	(in mM)
Na^+	130-145
K^+	0-4
Ca^{2+}	0.5-2.0

Mg^{2+}	0-1.0
Anions	
Cl^-	90-120
1-lactate$^-$	0-55
pyruvate	0-55
d-betahydroxybutyrate	0-55
acetoacetate	0-55

provided that in any given such solution the total amount of 1-lactate, pyruvate, d-betahydroxybutyrate and/or acetoacetate anion present ranges from about 0.1 to 55 mM with the total number of indicated cations present being such as to achieve electrical neutrality with the total number of anions present, and also provided that said solution has a pH ranging from about 5 to 8.2, and further provided that said solution has a milliosmolarity ranging from about 250 to 600 mOs/l.

24. A solution for dialysis therapy comprising water having dissolved therein the following components in the respective amounts indicated:

Component	Quantity

Cations	(in mM)
Na^+ with substantially no d-lactate	130-145
K^+	0-4
Ca^{2+}	0.5-2.0
Mg^{2+}	0-1.0
Anions	
Cl^-	90-120
1-lactate$^-$	0-55
pyruvate	0-55
d-betahydroxybutyrate	0-55
acetoacetate	0-55

provided that the total amount of 1-lactate, pyruvate, d-betahydroxybutyrate and/or acetoacetate anions present in any given solution ranges from about 0.1 to 55 mM with the total number of indicated cations present being such as to achieve electrical neutrality, and also provided that said solution has a pH ranging from about 5 to 8.2.

25. The process of claim 23 wherein said process comprises hemodialysis and where said solution additionally contains from about 20 to 55 mM of bicarbonate anions and wherein said solution

also contains a sufficient portion of at least one of said l-lactate, pyruvate, d-betahydroxybutyrate, and/or acetoacetate anions which are derived at least in part from the addition to said solution of, respectively, at least one of l-lactic acid, pyruvic acid, d-betahydroxybutyric acid and/or acetoacetic acid in a total amount which is sufficient to produce a pH in the range from about 5 to 8.2, and said solution contains sufficient nonionic dissolved nutrients to achieve a solution milliosmolarity of from about 260 to 540 mOsmoles/Liter.

26. The solution of claim 24 wherein said solution additionally contains from about 20 to 55 mM of bicarbonate anions and wherein said solution also contains a sufficient portion of at least one of said 1-lactate, pyruvate, d-betahydroxybutyrate and/or acetoacetate anions which are derived at least in part from the addition to said solution of, respectively, at least one of 1-lactic acid, pyruvic acid, d-betahydroxybutyric acid and/or acetoacetic acid in a total amount which is sufficient to produce a pH in the range from about 5 to 8.2, and said solution contains sufficient nonionic dissolved nutrients to achieve a solution milliosmolarity of from about 250 to 550 mOsmoles/Liter.

27. The process claim 23 wherein said process comprises peritoneal dialysis and wherein said fluid is infused into the peritoneal cavity of said patient, allowed to dwell there for a time ranging from about 1/2 to four hours, and then is drained off, wherein said solution additionally contains from about 20 to 55 mM/l of bicarbonate anions, and wherein said solution also contains a sufficient portion of at least one of said 1-lactate, pyruvate, d-betahydroxybutyrate, and/or acetoacetate anions derived from the addition to said solution of, respectively, at least one of 1-lactic acid, pyruvic acid, d-betahydroxybutyric acid and/or acetoacetic acid in a total amount which is sufficient to produce a pH in the range from about 5.5 to 7.5, and said solution also contains sufficient nonionic dissolved nutrients to achieve a solution milliosmolarity of from about 260 to 550 mOsmoles/Liters.

28. The solution of claim 24 wherein said solution additionally contains from about 20 to 55 mM of bicarbonate anions and wherein said solution also contains a sufficient portion of at least one of said 1-lactate, pyruvate, d-betahydroxybutyrate, and/or acetoacetate anions derived from the addition to said solution of, respectively, at least one of 1-lactic acid, pyruvic acid, d-betahydroxy-butyric acid and/or acetoacetic acid in a total amount which is

sufficient to produce a pH in the range from about 5.5 to 7.5, and said solution also contains sufficient nonionic dissolved nutrients to achieve a solution milliosmolarity of from about 260 to 550 mOsmoles/Liter.

29. The process of claim 21 wherein said introduction is accomplished parenterally and wherein said solution additionally contains from about 20 to 55 mM of bicarbonate anions and wherein said solution also contains a sufficient portion of at least one of said 1-lactate, pyruvate, d-betahydroxybutyrate, and/or acetoacetate anions derived from the addition to said solution of, respectively, at least one of 1-lactic acid, pyruvic acid, d-betahydroxybutyric acid and/or acetoacetic acid in a total amount which is sufficient to produce a pH in the range from about 5.5 to 7.5, and said solution also contains sufficient nonionic dissolved nutrients to achieve a solution milliosmolarity of from about 260 to 550 mOsmoles/Liter.

30. The process of claim 1 wherein said solution additionally contains at least one 1-amino acid.

31. The process of claim 1 wherein said solution has an osmolarity ranging from about 240 to 2400 mOsmoles per liter.